

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

- 1 1. (currently amended) A method of forming an integrated circuit package having a sensor with imaging capability comprising:
 - 3 connecting components to a single-piece substrate, including
 - 4 fixing an integrated circuit die to a first area of said single-piece substrate
 - 5 and fixing a light source to a second area of said single-piece substrate, said
 - 6 integrated circuit die having said sensor, said single-piece substrate being a
 - 7 lead frame, said fixing of said integrated circuit die including using die attach
 - 8 techniques; and
 - 9 enclosing said components to define said integrated circuit
 - 10 package having exposed input/output connections and having a window
 - 11 optically aligned with said sensor;
 - 12 wherein said first and second areas of said single-piece
 - 13 substrate are at an angle to each other within said integrated circuit package,
 - 14 such that an axis of light from said light source is non-parallel to an imaging
 - 15 axis of said sensor and such that said light source illuminates a field of view of
 - 16 said sensor[[.]] , said connecting said components including attaching said
 - 17 integrated circuit die and said light source to said lead frame while said lead
 - 18 frame is substantially flat, said enclosing including bending said lead frame to
 - 19 establish said angle of said first area to said second area; and
 - 20 wherein said method further comprises forming an electrically
 - 21 insulative material on opposite sides of said lead frame prior to connecting
 - 22 said components, thereby defining a package form, said package form being
 - 23 patterned to include a locking mechanism, said bending of said lead frame
 - 24 including utilizing said locking mechanism to fix said lead frame in a position
 - 25 to establish said angle.

1 2.-4. (cancelled)

1 5. (currently amended) The method of claim 1 [[4]] wherein defining said
2 package form includes fabricating separate first and second portions on said
3 lead frame, said first and second portions having cooperative structural
4 features which define said locking mechanism.

1 6.-8. (cancelled)

1 9. (original) The method of claim 1 wherein connecting said components
2 includes providing said integrated circuit die to include a matrix of pixel
3 elements and to include digital signal processing circuitry, said angle being
4 selected to establish a light-source-to-sensor relationship in which light from
5 said light source illuminates a surface being imaged by said matrix of pixel
6 elements, said matrix of pixel elements being said sensor.

1 10. (original) The method of claim 9 wherein enclosing said components
2 includes attaching a lens system for directing said light from said light source
3 and for collecting light reflected from said surface toward said matrix of pixel
4 elements, thereby providing a module for electrical and mechanical
5 connection within an electronic device.

1 11. (original) The method of claim 10 wherein connecting said components
2 includes providing said integrated circuit die such that said digital signal
3 processing circuitry is dedicated to generating navigation information specific
4 to movement of said sensor relative to said surface being illuminated by said
5 light source.

1 12.-16. (cancelled)

1 17. (original) A method of forming an integrated circuit package comprising:
2 providing a generally flat lead frame having spaced apart
3 first and second areas for receiving components and having a plurality of
4 input/output conductors;
5 forming a first package portion about said first area of said
6 lead frame;
7 forming a second package portion about said second area of
8 said lead frame;
9 fixing a sensor die to said first area, including electrically
10 connecting said sensor die to at least some of said input/output conductors;
11 fixing a light source to said second area, including electrically
12 connecting said light source to at least one of said sensor die and said
13 input/output conductors; and
14 bending said lead frame in a region between said first and
15 second areas to establish a condition in which light from said light source
16 illuminates a field of view of said sensor die.

1 18. (original) The method of claim 17 further comprising securing said lead
2 frame in said condition using physical features of said first and second
3 package portions, wherein said first and second package portions are formed
4 using molding techniques.

1 19. (original) The method of claim 17 wherein fixing said sensor die includes
2 using die attach and wire bonding techniques for a device having a matrix of
3 pixel elements and circuitry dedicated to determining navigation information.

1 20. (original) The method of claim 17 further comprising attaching a lid to
2 said first and second package portions after said bending, said lid including a
3 lens system for directing said light from said light source and collecting light
4 for said sensor die, wherein attachment of said lid forms a module for
5 connection within an electronic device.

1 21. (currently amended) A method of forming an integrated circuit package
2 comprising:

3 fabricating a lead frame having a plurality of input/output
4 conductors, said lead frame having spaced apart first and second areas for
5 receiving components;

6 forming a multi-portion package body of electrically insulative
7 material on said lead frame, said package body including first and second
8 portions with structural features that define a locking mechanism for
9 selectively securing said first portion to said second portion such that said first
10 and second areas are at a selected angle with respect to each other;

11 fixing a sensor die to said first area, including electrically
12 connecting said sensor die to at least some of said input/output conductors;
13 [[and]]

14 fixing a light source to said second area, including connecting
15 said light source to at least one of said sensor die and said input/output
16 conductors; and

17 engaging said locking mechanism to secure said first portion to
18 said second portion after said sensor die and light source are fixed to said first
19 and second areas, respectively;

20 wherein said selected angle is such that a condition is
21 established in which light from said light source illuminates a field of view of
22 said sensor die.

- 1 22. (original) The method of claim 21 wherein fixing said sensor die includes
- 2 using die attach and wire bonding techniques for a device having a matrix of
- 3 pixel elements and circuitry dedicated to determining navigation information.

- 1 23. (original) The method of claim 21 further comprising attaching a lid to
- 2 said package body, said lid including a lens system for directing said light
- 3 from said light source and collecting light for said sensor die, wherein
- 4 attachment of said lid forms a module for connection within an electronic
- 5 device.

- 1 24. (original) The method of claim 21 wherein fixing said sensor die includes
- 2 using die attach and wire bond techniques for a die having a matrix of pixel
- 3 elements and circuitry dedicated to determining navigation information on the
- 4 basis of image information from said matrix.